



Beth Israel Deaconess
Medical Center



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

“Why I Treat It and How”

AV graft outflow vein stenosis

Yael Vin, MD, MPH, FACS

Opening points

1. GRAFTS ARE AN EXCELLENT OPTION FOR SOME PATIENTS



Opening points

2. GRAFTS DETERIORATE WITH TIME

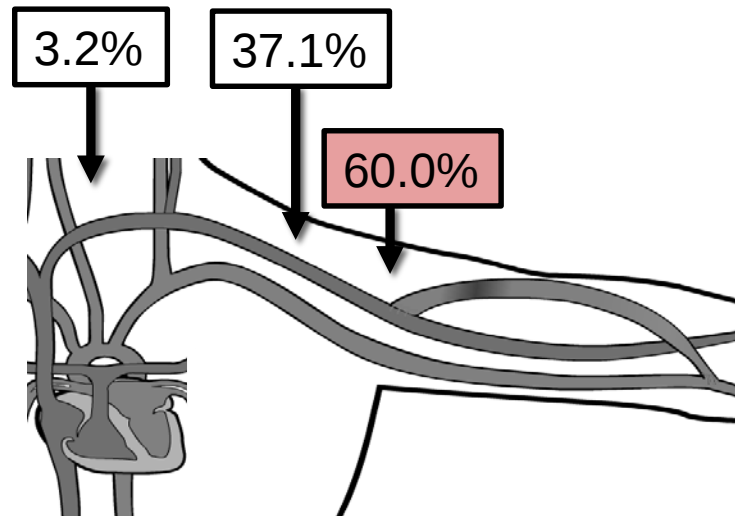


GIVEN ENOUGH TIME, ALL GRAFTS WILL EVENTUALLY FAIL

Opening points

2. GRAFTS DETERIORATE WITH TIME

Venous outflow stenosis-
most common cause of graft dysfunction and failure



Opening points

3. OUR GOAL IS TO 'BUY TIME'
(use the access as long as possible)



Keep patients safe
Minimize number of procedures



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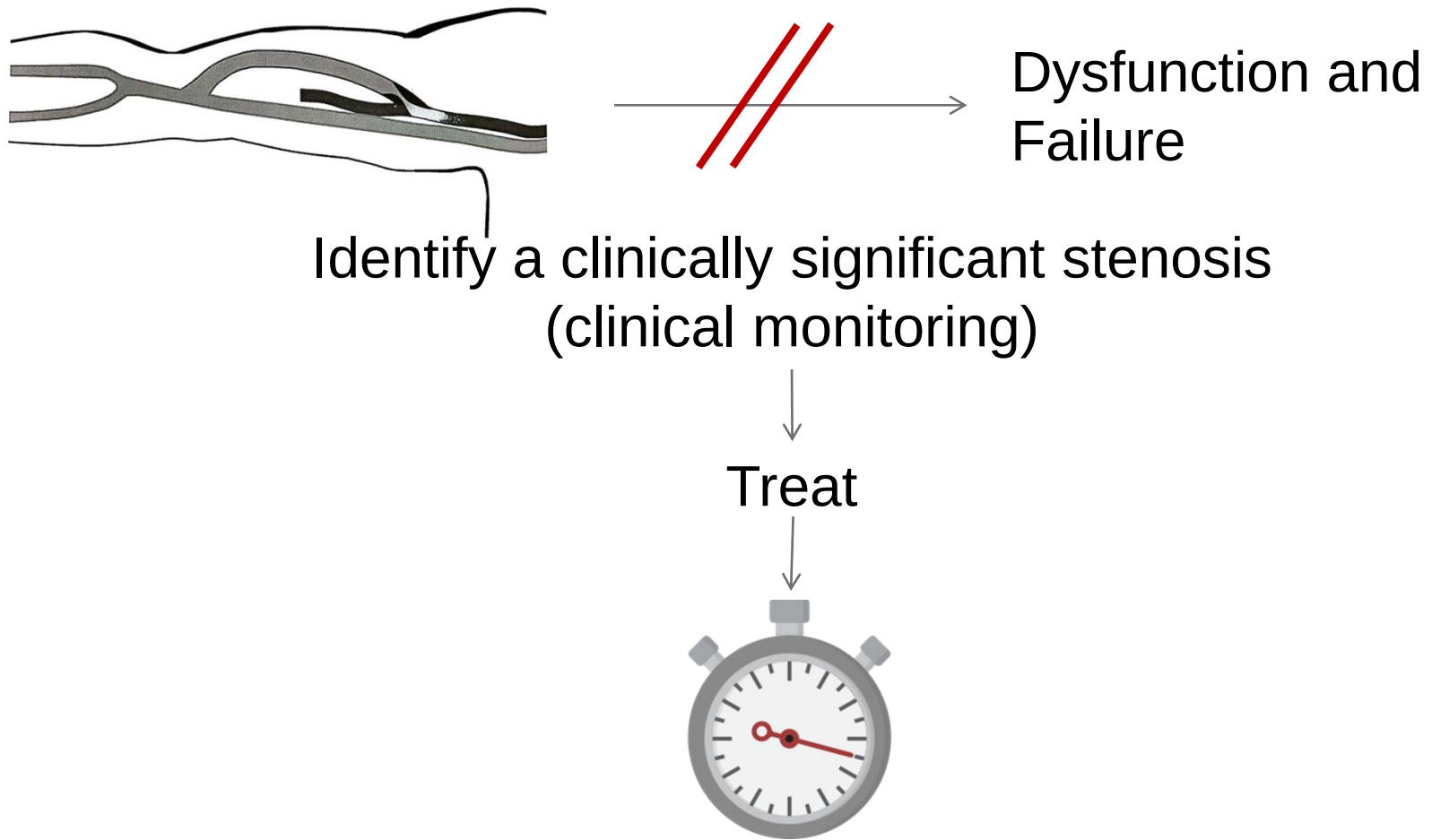


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AV graft outflow vein stenosis

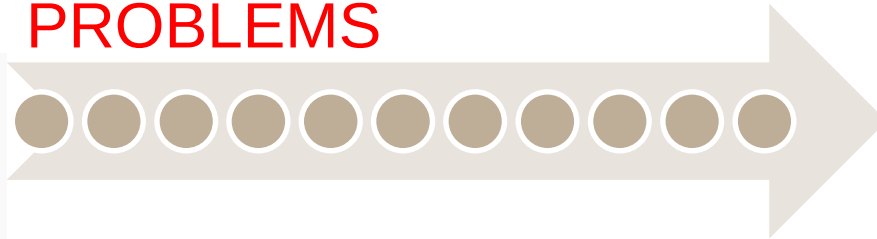
Why (indications to treat)



Why (indications to treat)

Monitoring (units):

PROBLEMS



High venous pressures
Prolonged bleeding
Difficulty cannulating
Decreased clearances
Swelling
Growing pseudoaneurysms
Clotted graft

*Variability in proficiency

*Difficulty to tracking trends

Why (indications to treat)

Our own limited 'monitoring and surveillance program'



**ACCESS EXAM
DUPLEX FLOWS**

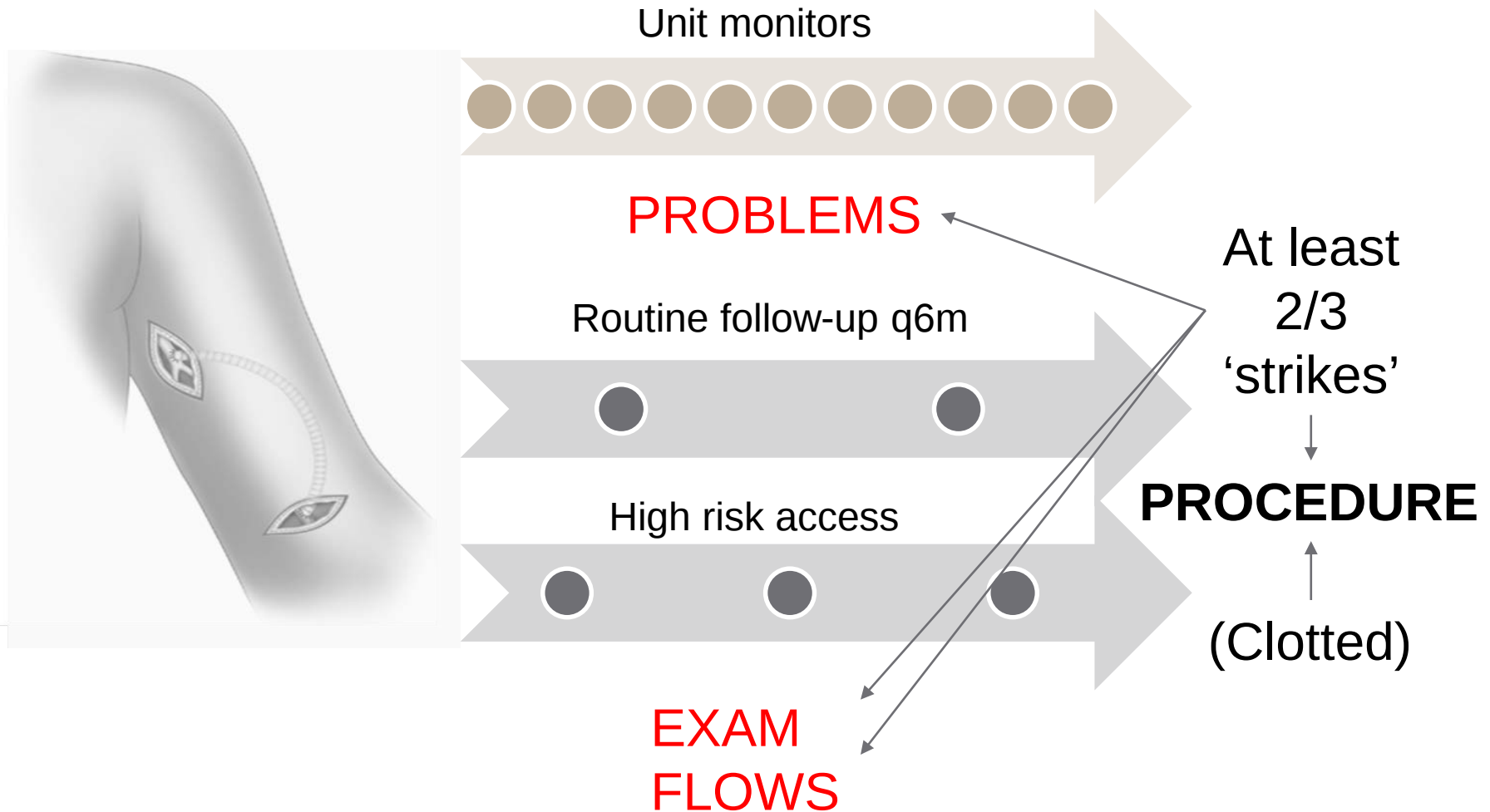
Routine follow-up q6m



High risk access



Why (indications to treat)





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“Why I Treat It and **How**”

AV graft outflow vein stenosis

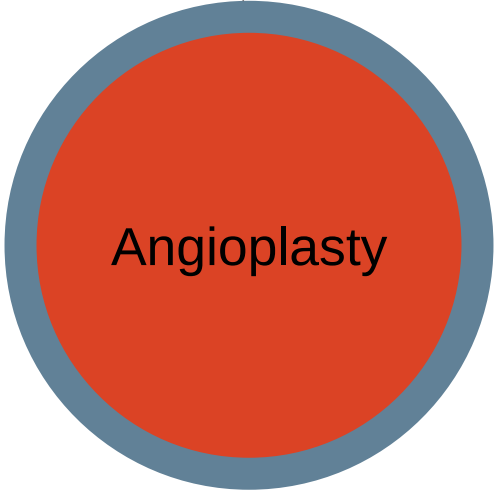
Angioplasty

Suspected clinically significant stenosis ($\geq 2/3$ 'strikes')

Fistulogram

Angiographically significant stenosis ($>50\%$)

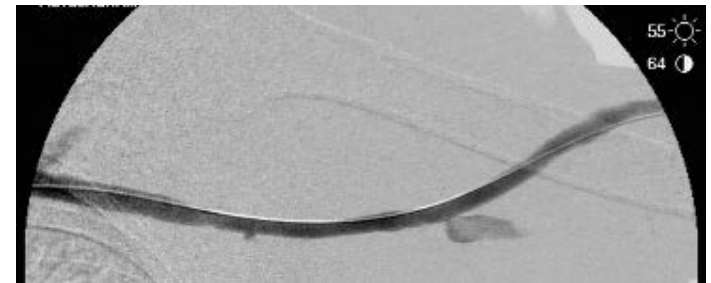
Angioplasty



Outpatient, low risk

MEET LUCILLE

78 YEAR OLD
LEFT UPPER ARM GRAFT
Created October 2010



▶ Prolonged bleeding, low flows

2010

2011

2012

2013

2014

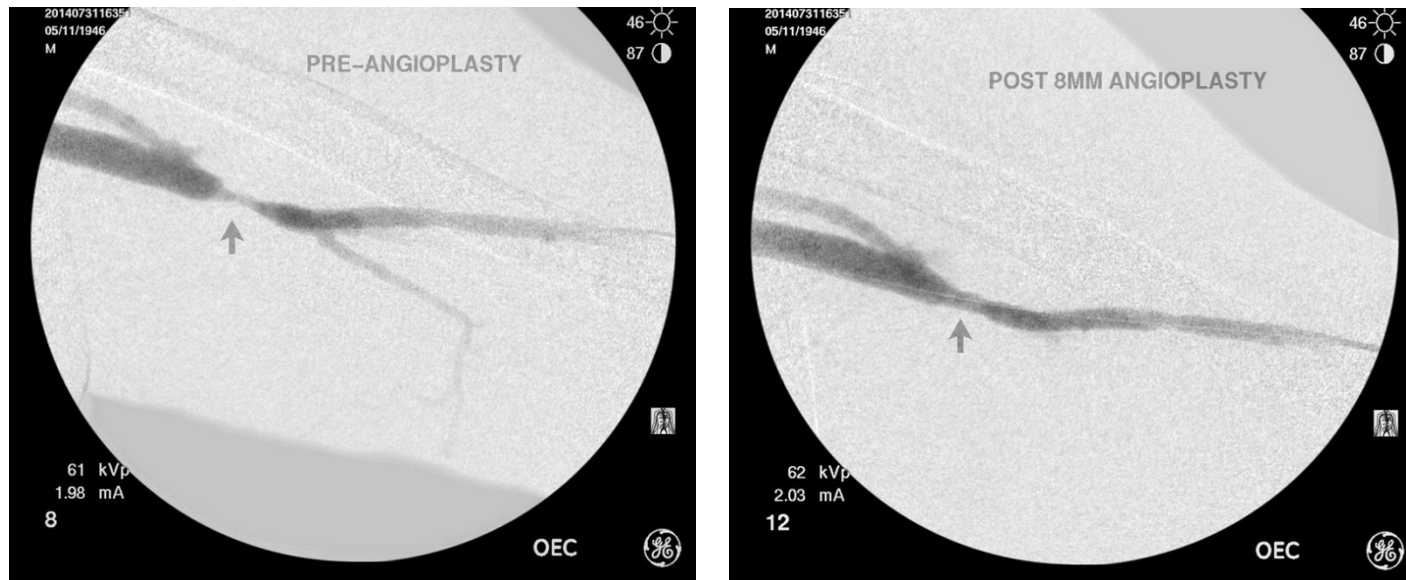
2015

2016

2017

Angioplasty

“SUCCESSFUL ANGIOPLASTY”?



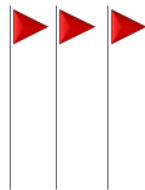
Guidelines: <30% stenosis

Goal: No stenosis

Improved exam, flows back to baseline



LUCILLE REQUIRES
2 ADDITIONAL ANGIOPLASTIES



2010

2011

2012

2013

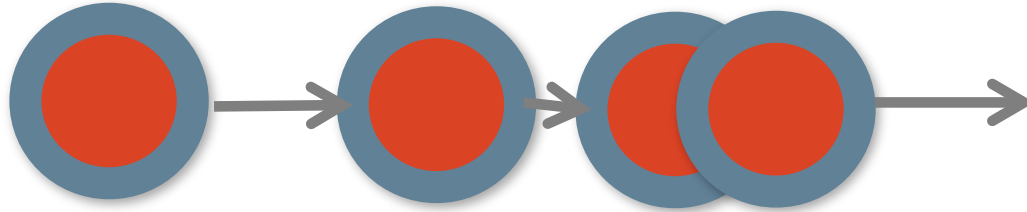
2014

2015

2016

2017

Angioplasty



Venous anastomosis- high risk for angioplasty failure

REVISE trial: 6 months lesion primary patency rates post angioplasty 36%

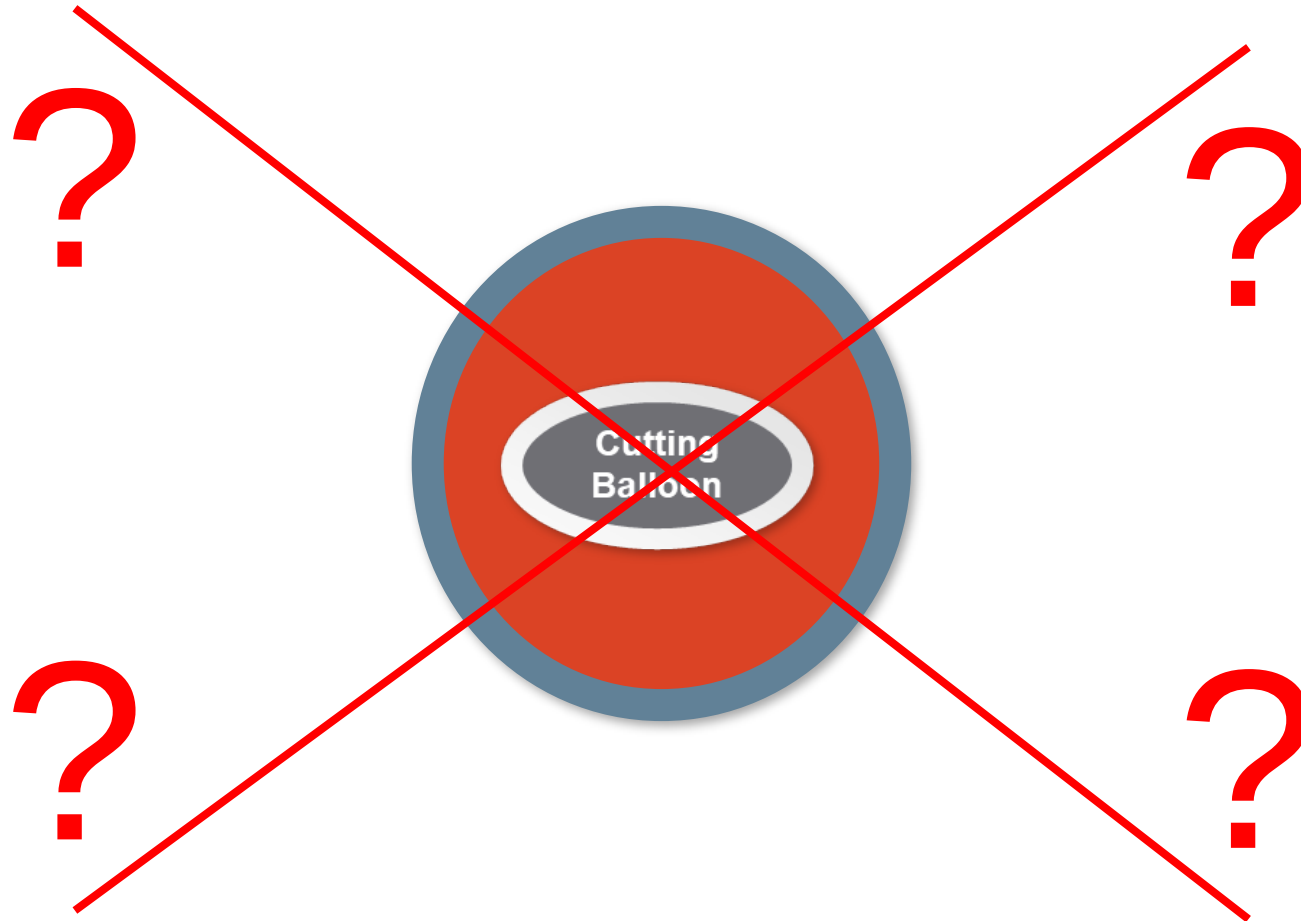
Technical Failure

Recoil

Early recurrence

Recurrence of
neointimal
hyperplasia

Can we do better?



Use of the peripheral cutting balloon to treat hemodialysis-related stenoses. J Vasc Interv Radiol 2005 Dec;16(12):1593-603.
Vesely TM, Siegel JB

Can we do better?

?

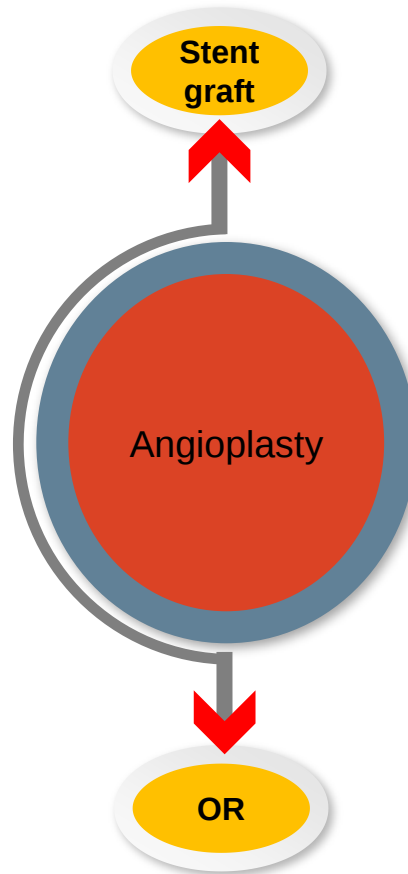
?



?

?

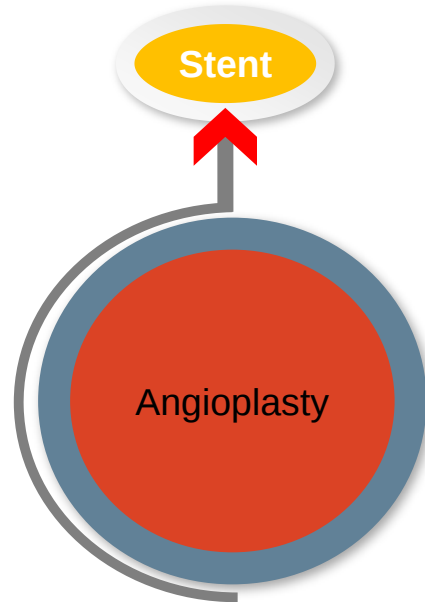
Can we do better?



When can we do better with STENTS?

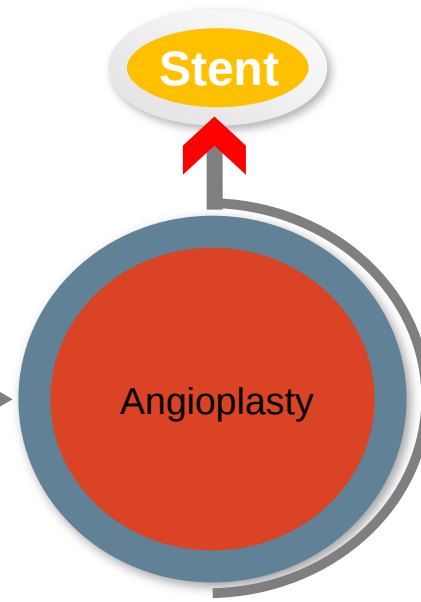
Indications for stenting:

Rupture
Technical failure

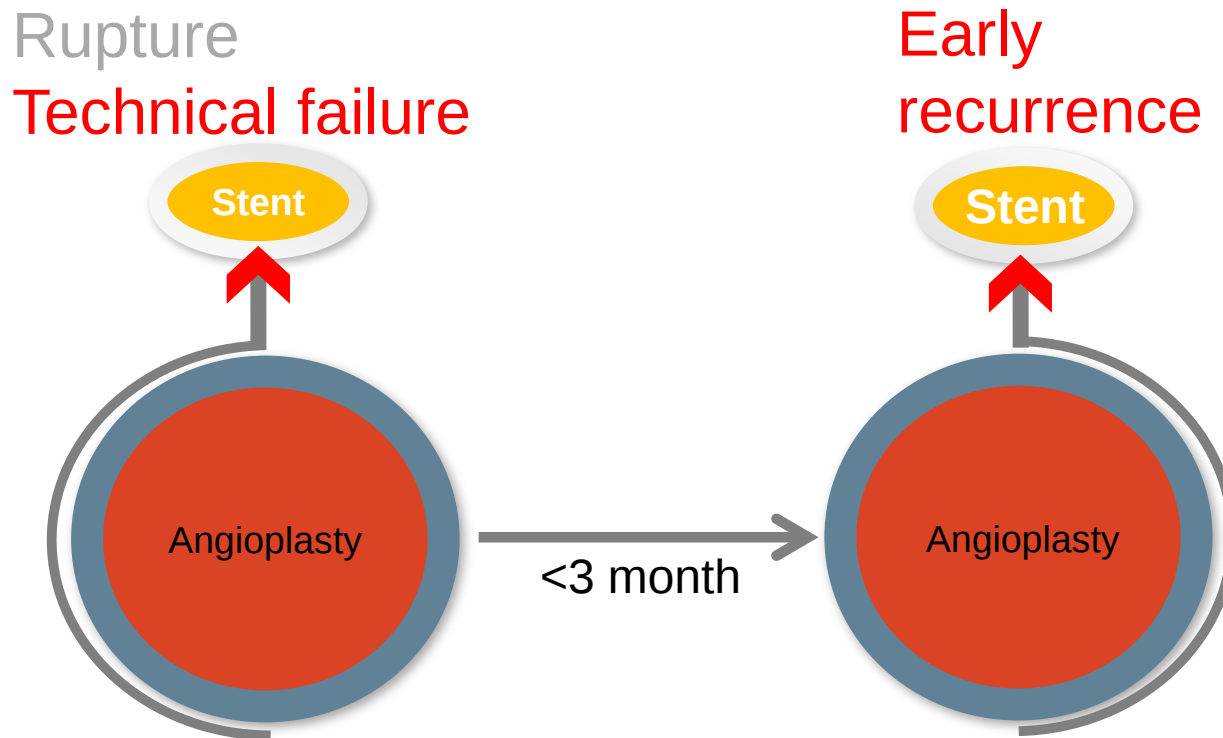


<3 month

Early
recurrence

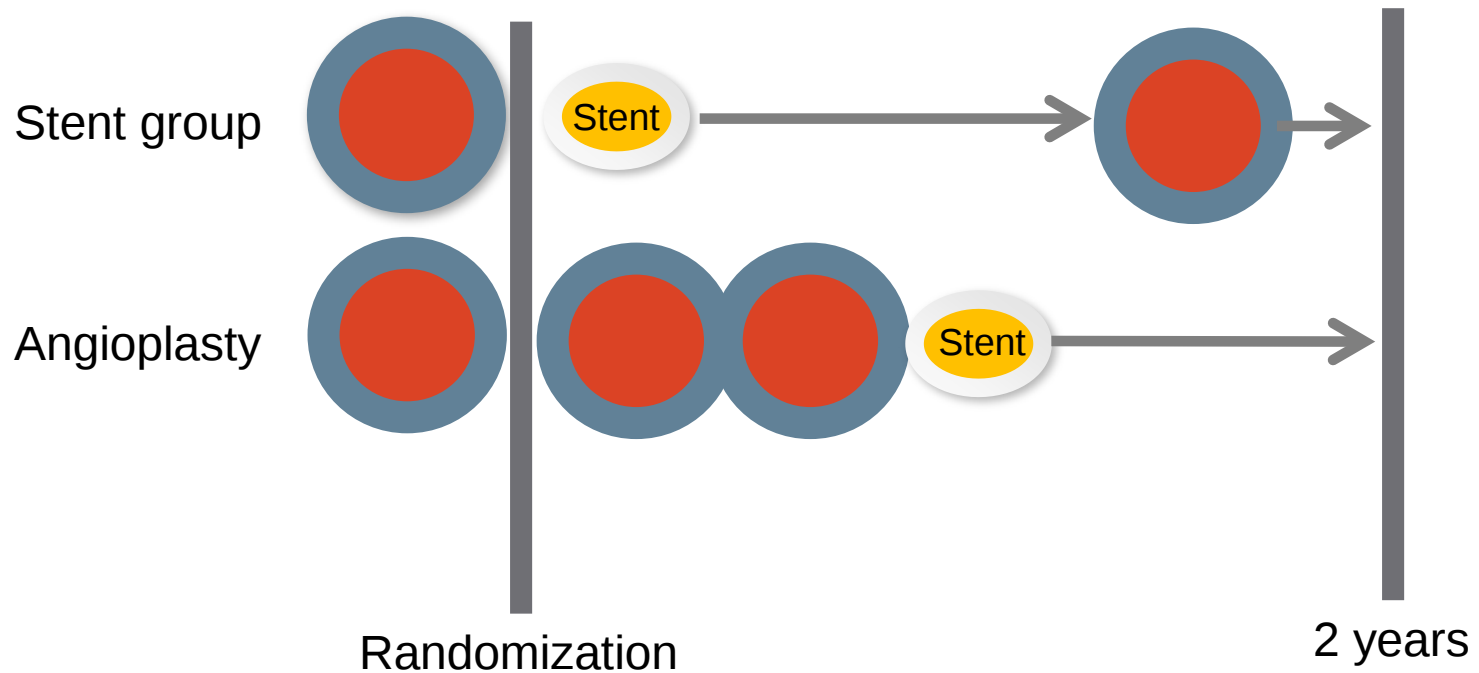


When can we do better with STENTS?

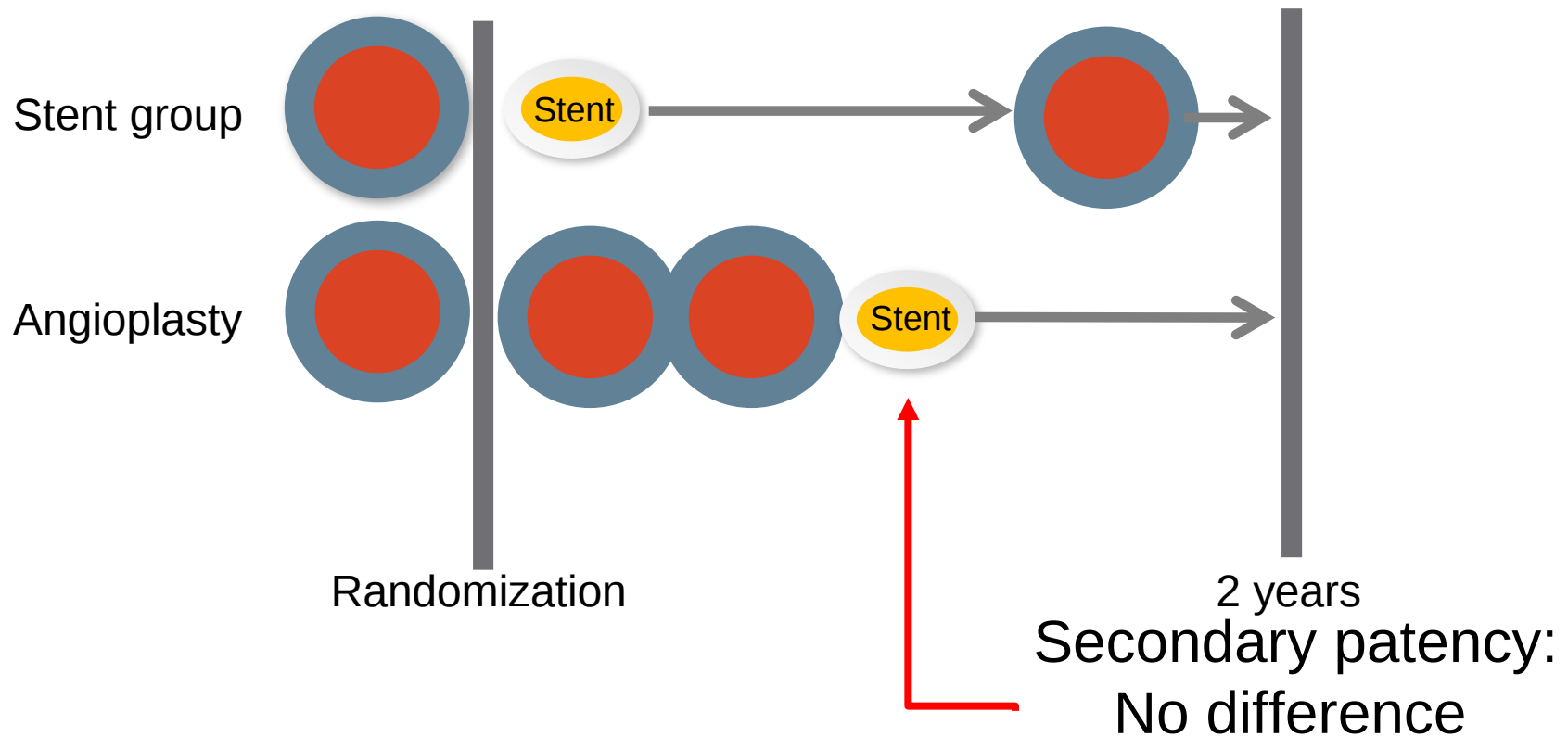


Should we stent for every significant graft outflow stenosis?

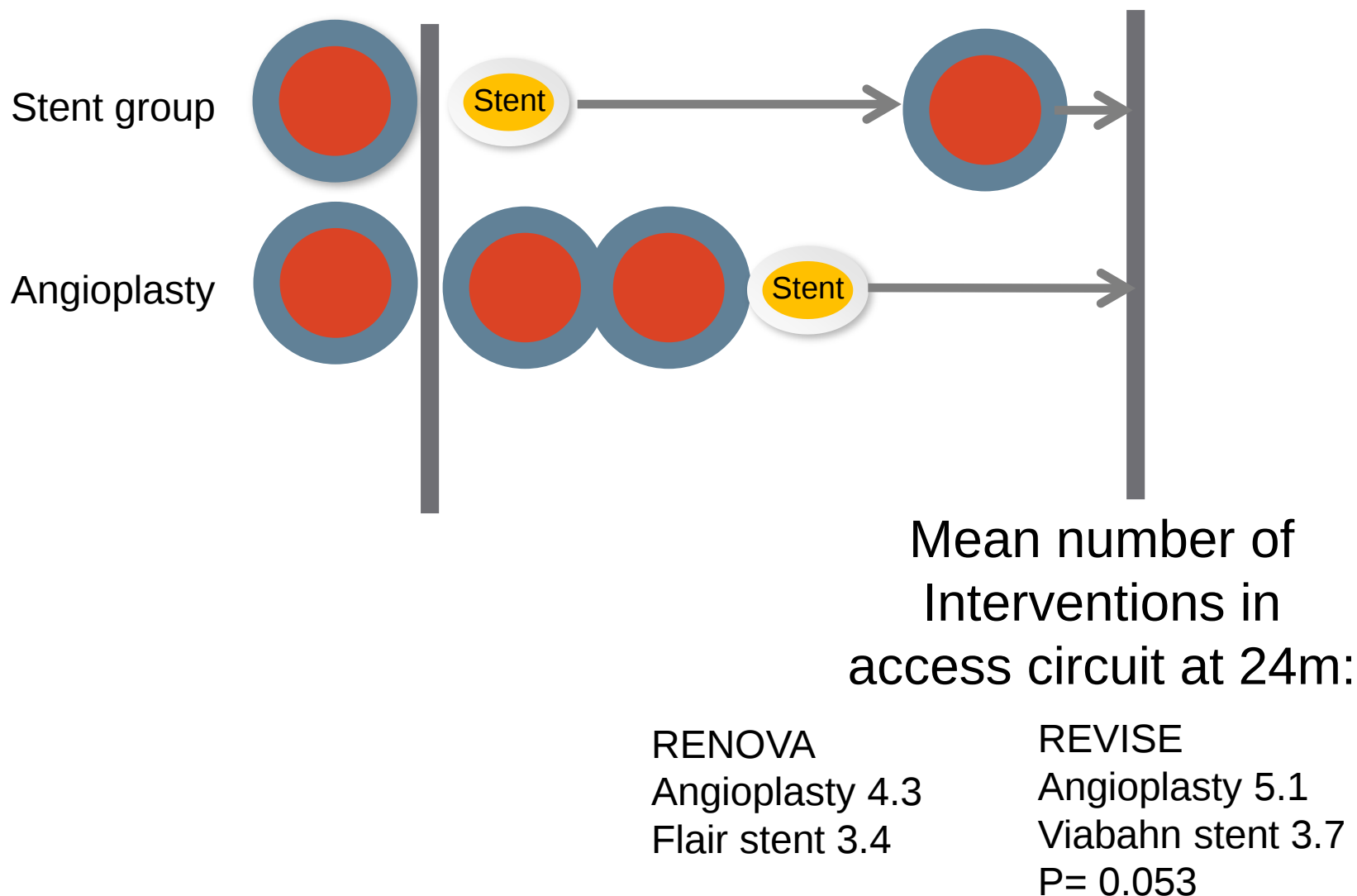
RENOVA TRIAL - Bard Flair stent
REVISE TRIAL - Gore Viabahn stent



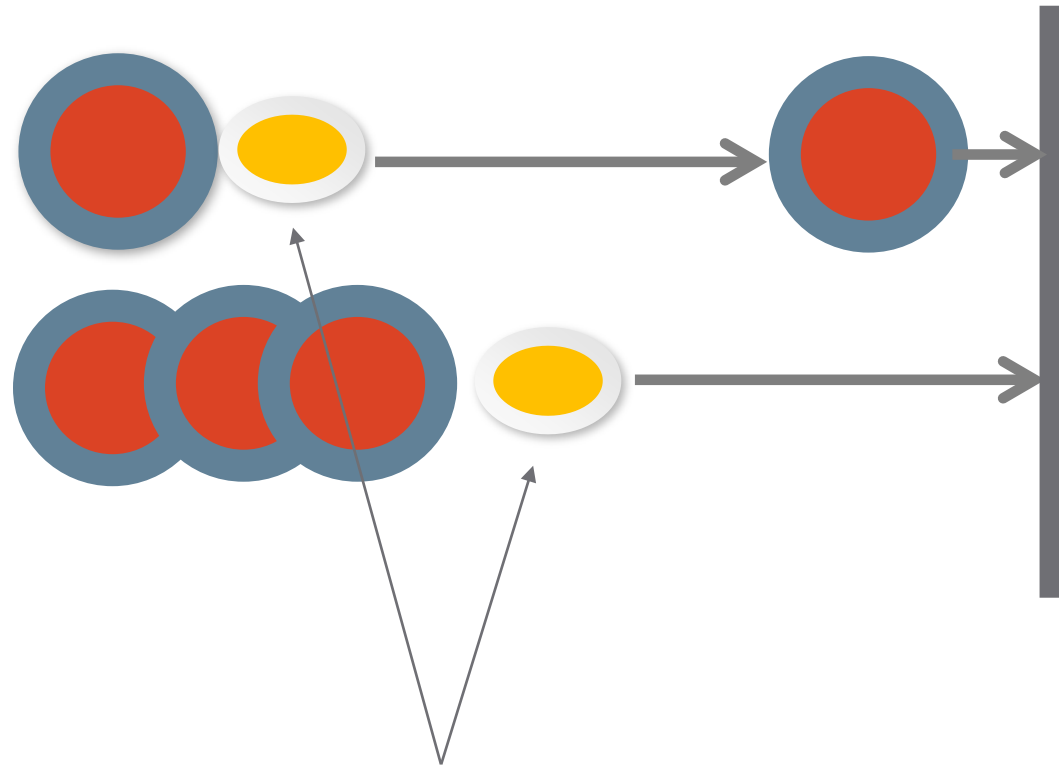
RENOVA TRIAL - Bard Flair stent
REVISE TRIAL - Gore Viabahn stent



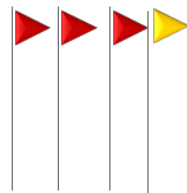
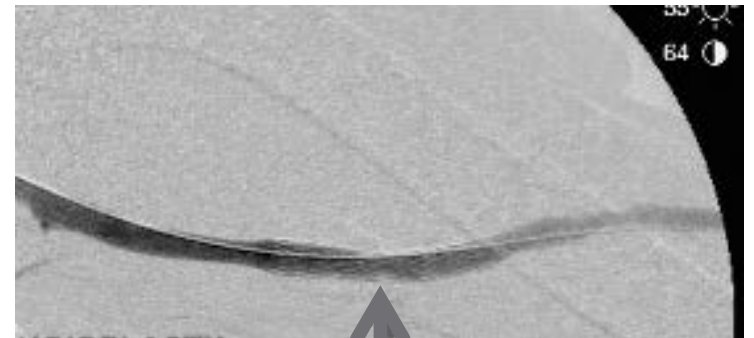
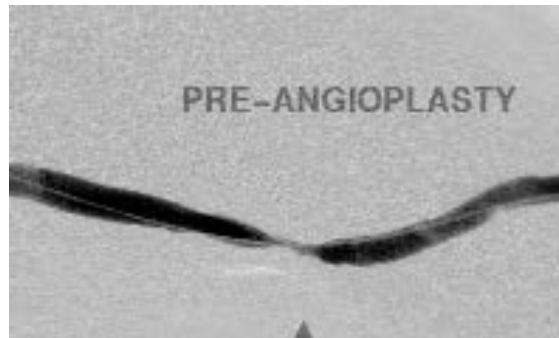
RENOVA TRIAL - Bard Flair stent
REVISE TRIAL - Gore Viabahn stent



When can we do better with STENTS?



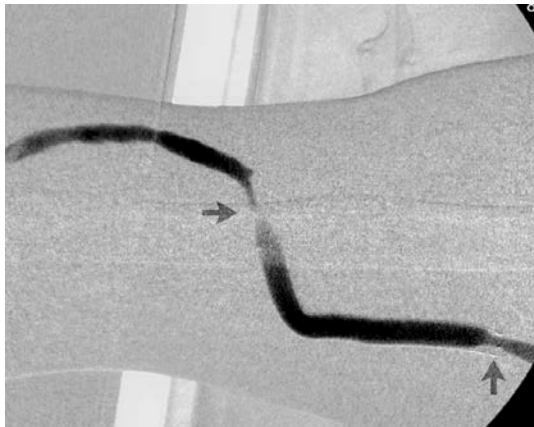
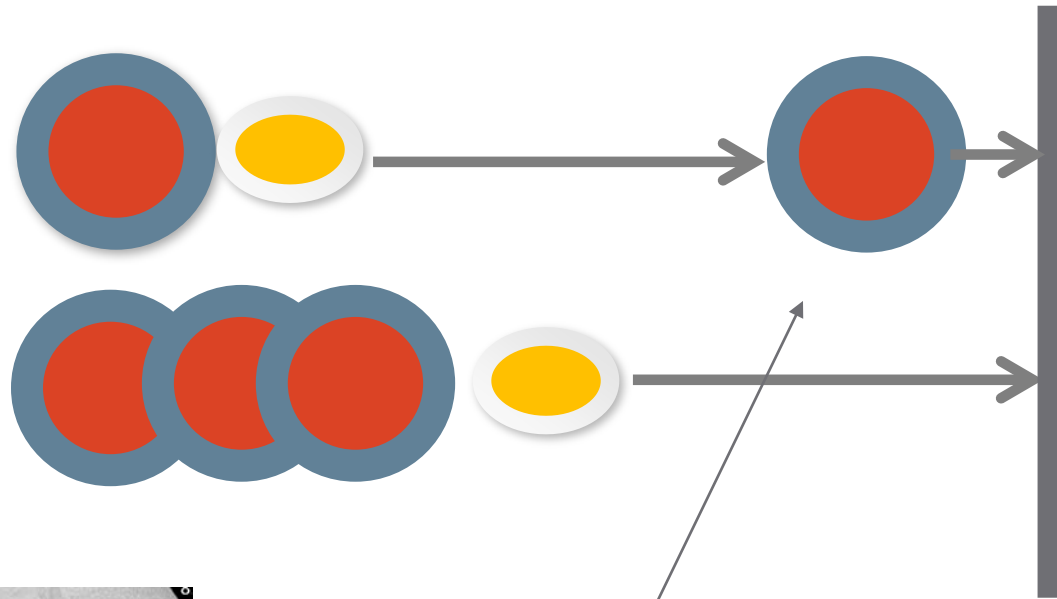
Stents are useful in maintaining patency
Continue stenting per guidelines
(rupture, recoil, early recurrence)



August 2012
Stent #1

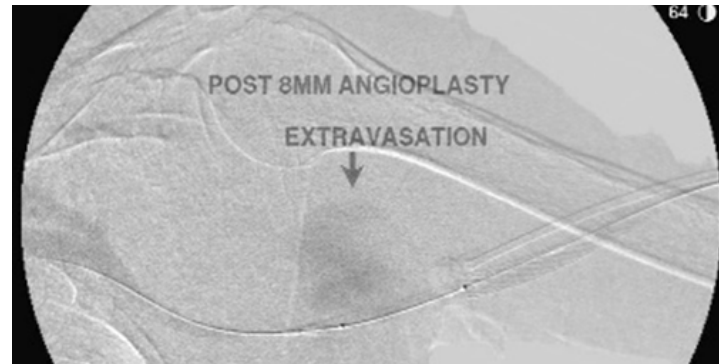


When can we do better with STENTS?

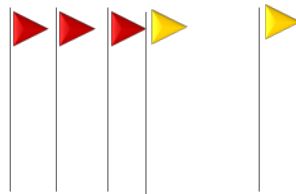


Eventually, primary patency is lost





Thrombectomy
Stenosis at proximal edge of stent
Extravasation post angioplasty
→ Stent #2



2010

2011

2012

2013

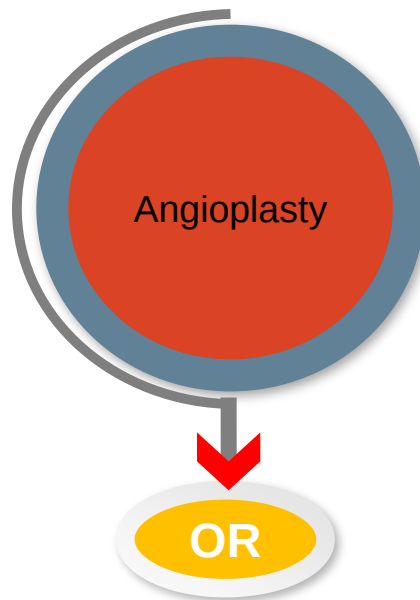
2014

2015

2016

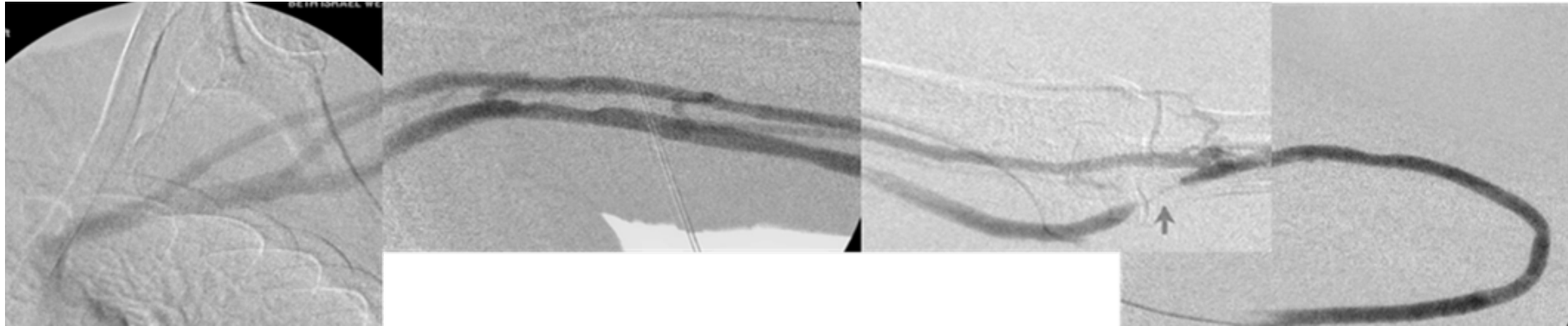
2017

When can we do better with SURGERY ?



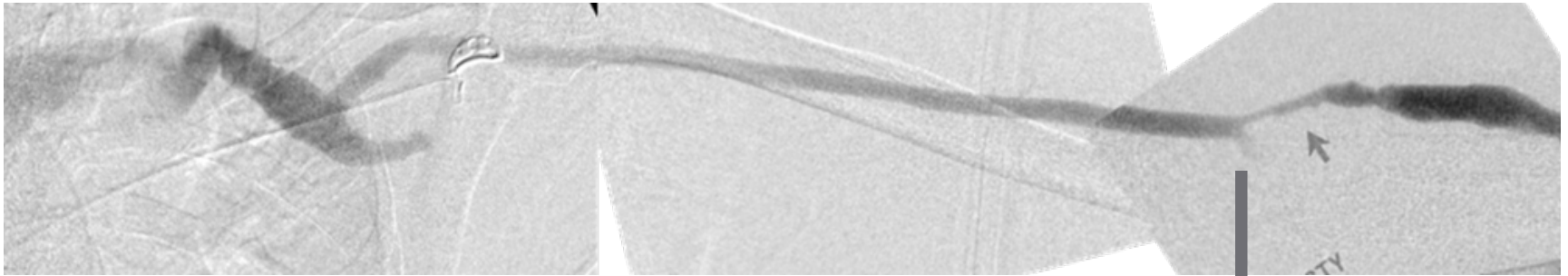
When can we do better with SURGERY ?

Forearm graft?

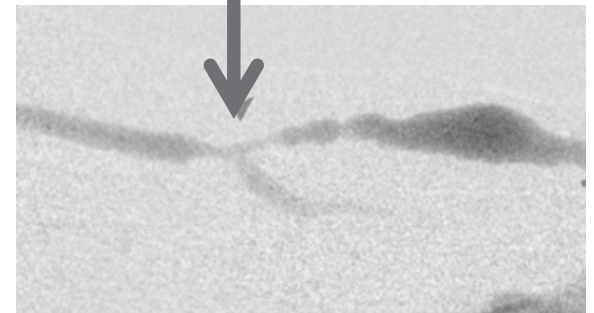


Consider secondary
fistula

When can we do better with SURGERY ?



2 angioplasties later



When can we do better with SURGERY ?

Upper arm,
no secondary fistula options

Is the graft in good condition?

NO

Consider revision options- Replace limb
Replace graft
Consider other arm (venogram)

When can we do better with SURGERY ?



When can we do better with SURGERY ?

Calcified old graft



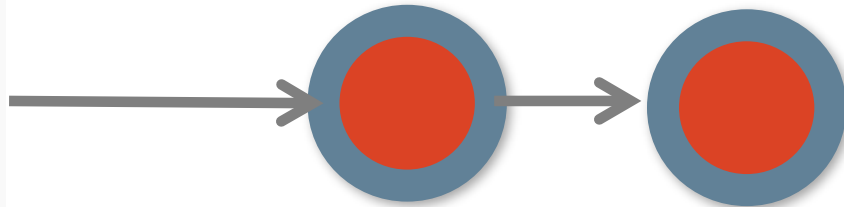
Intra-graft and
outflow stenosis
Large pseudoaneurysm



Patient passed away 3 months later from complications of pneumonia



Surgery is 'resetting the clock'



When can we do better with SURGERY ?

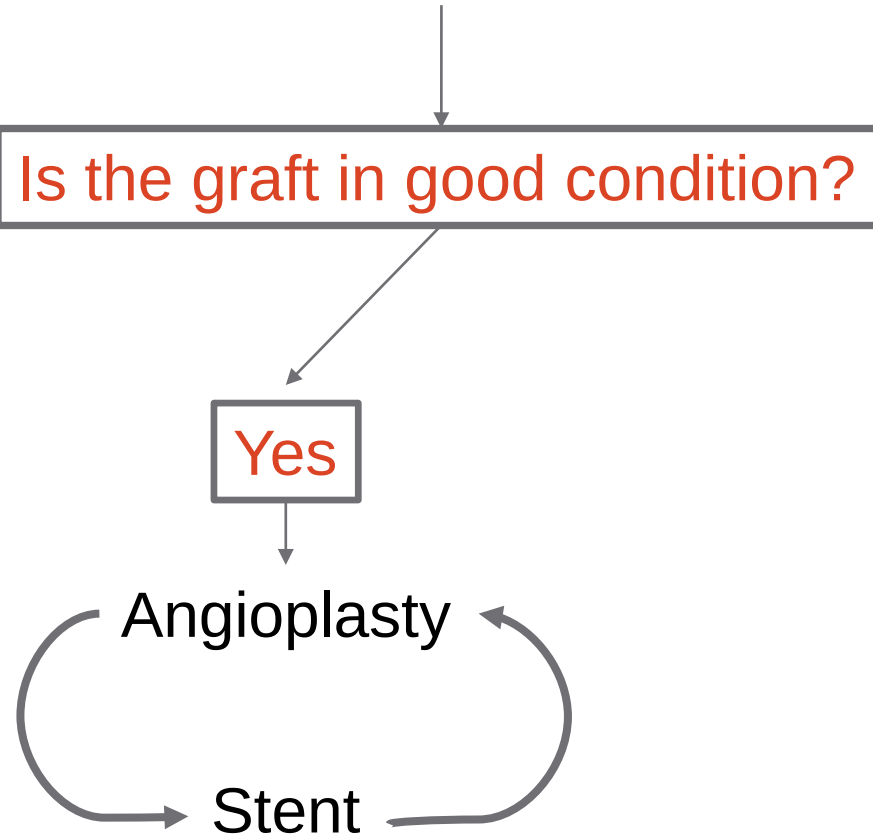
Upper arm,
no secondary fistula options

Is the graft in good condition?

Yes

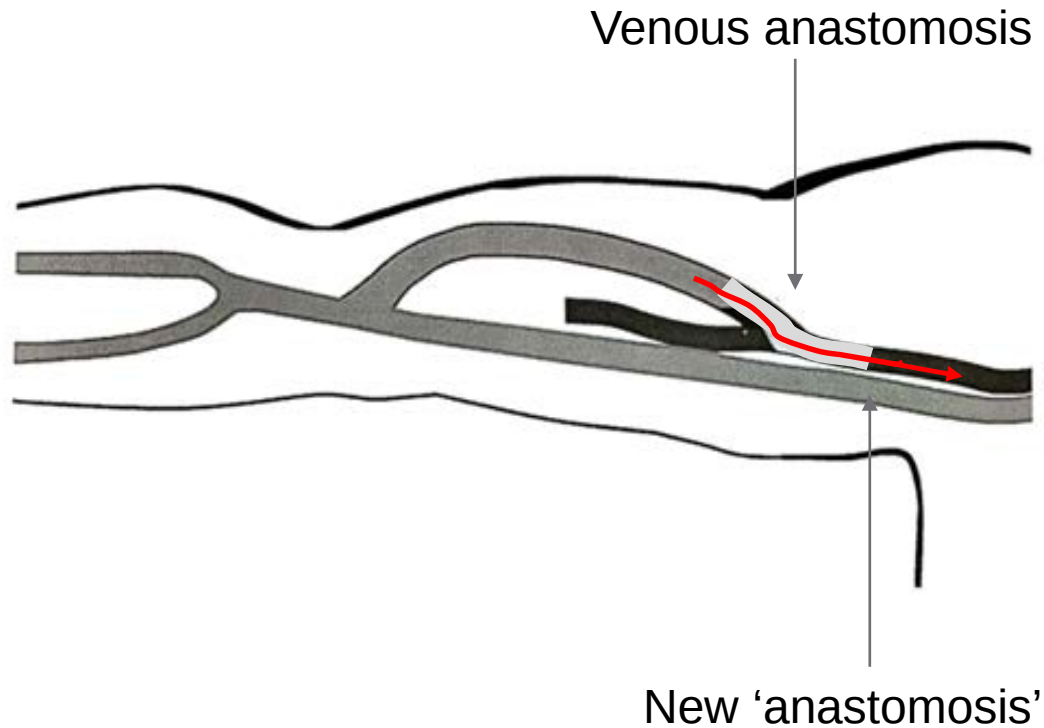
Angioplasty

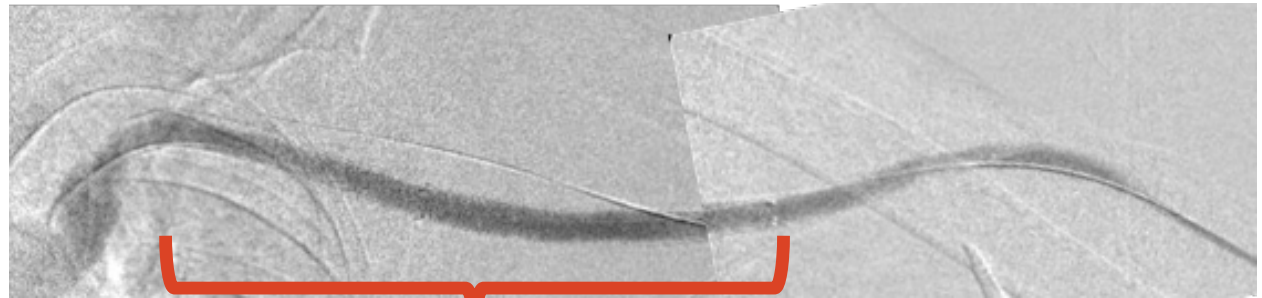
Stent



When can we do better with SURGERY ?

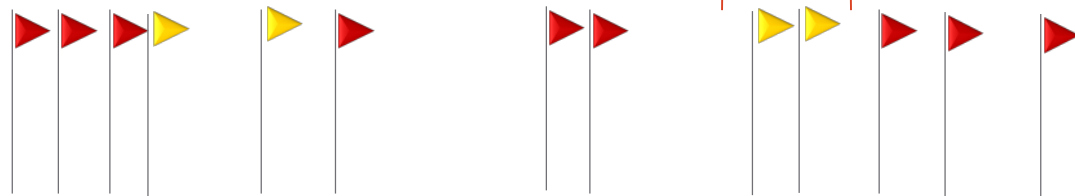
No guarantee that a new surgical anastomosis will do any better





stents

Stents #3 and #4



2010

2011

2012

2013

2014

2015

2016

2017

Right venogram

Lucille 1932-2017



2010

2011

2012

2013

2014

2015

2016

2017

Died of cardiac causes 3/2017
With a functioning graft

Lucille's Graft 2010-2017



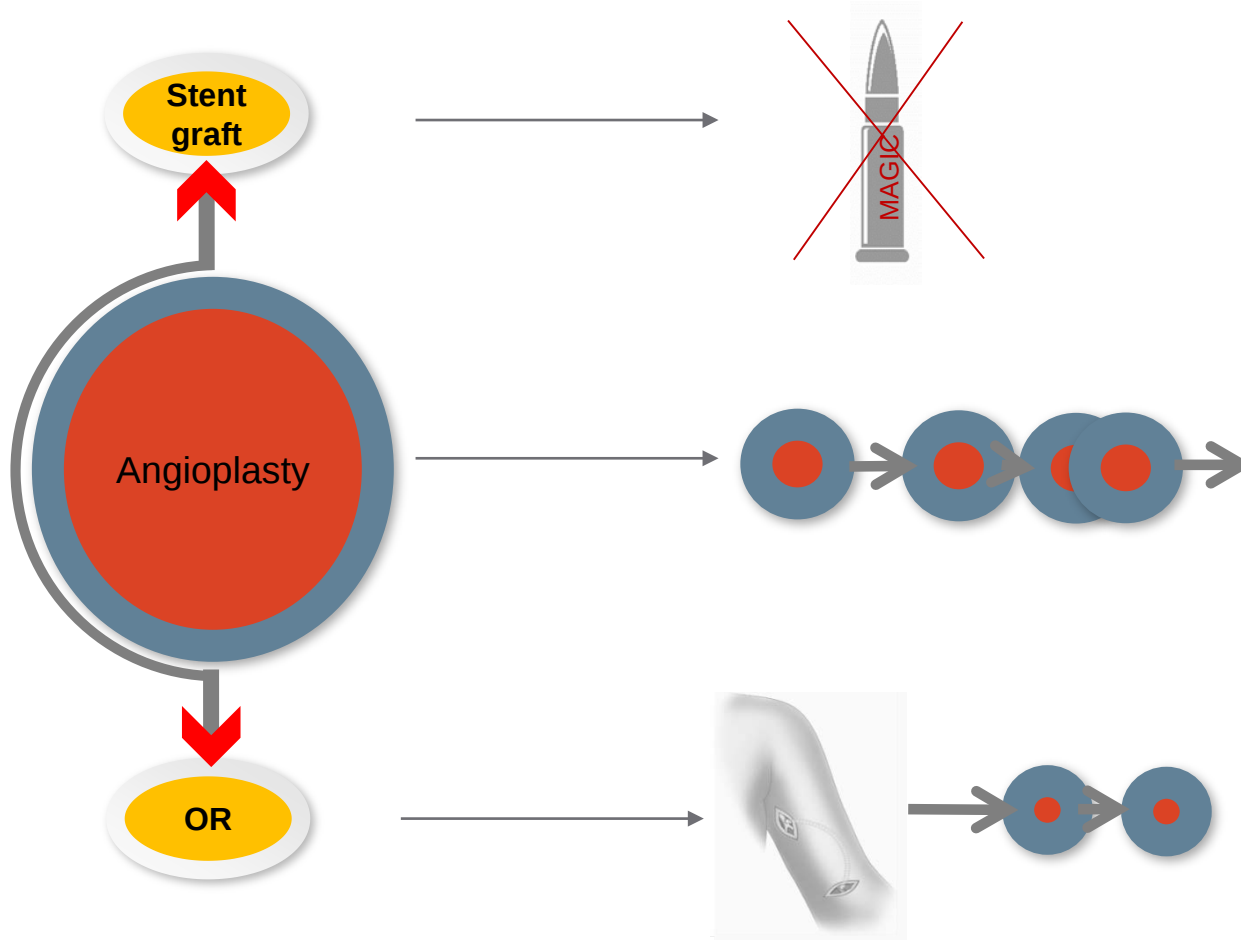
15 procedures, 4 stents

Not one night in the hospital
for access related issues

Closing points

What have we learned from Lucille?

OUR TREATMENTS DO NOT SOLVE THE PROBLEM



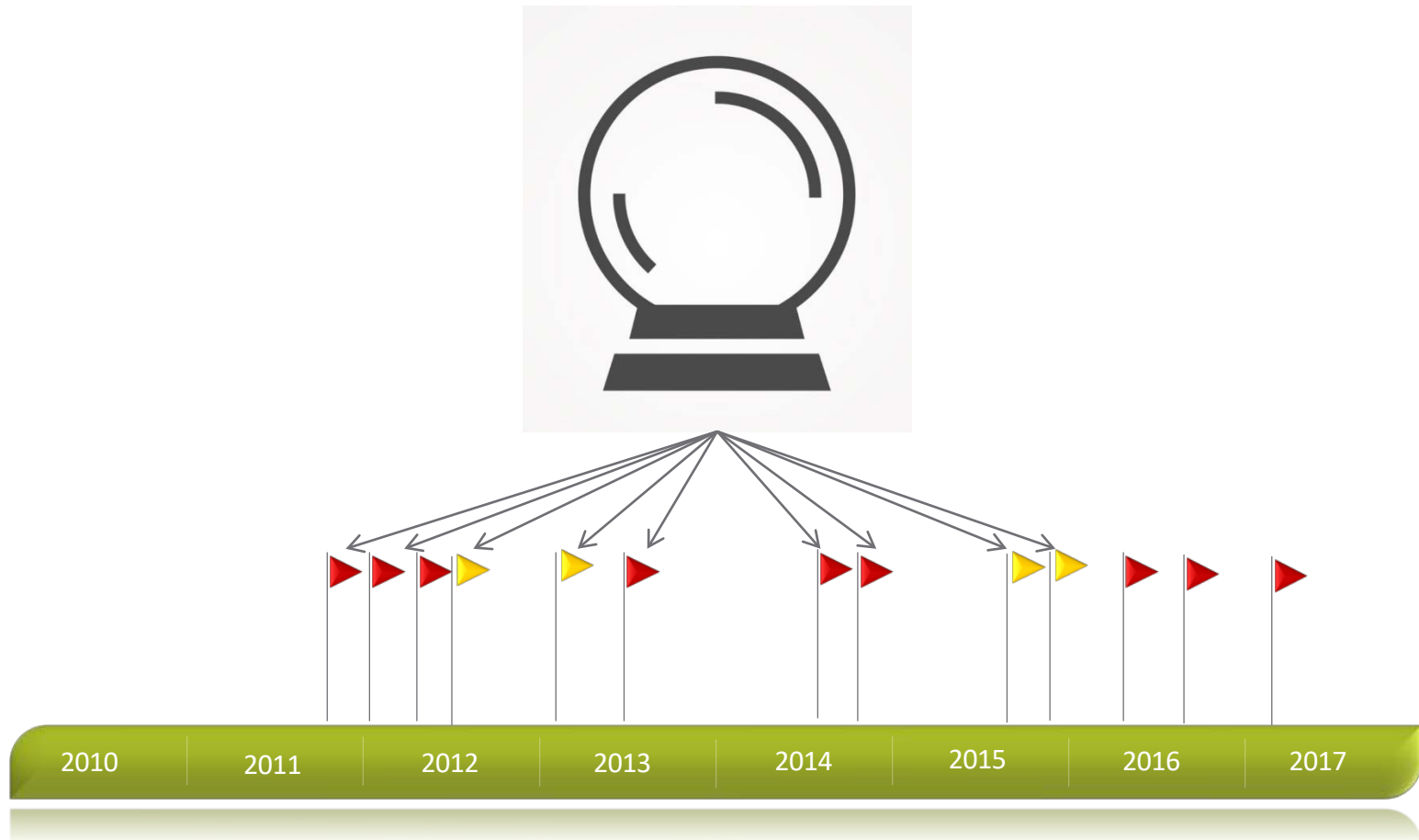
Closing points

WE ARE 'BUYING TIME' AT A HIGH COST
TO THE PATIENT AND THE SYSTEM



15 procedures,
4 stents

ON A CASE BY CASE BASIS,
YOU CAN NOT PREDICT THE COURSE



FOR NOW-
One step at a time



Always have a back-up plan
Be conservative

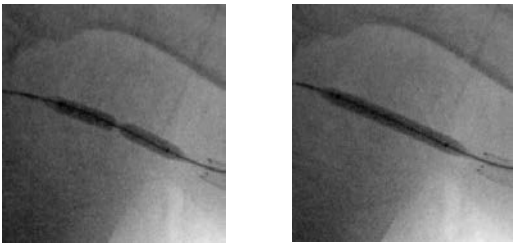
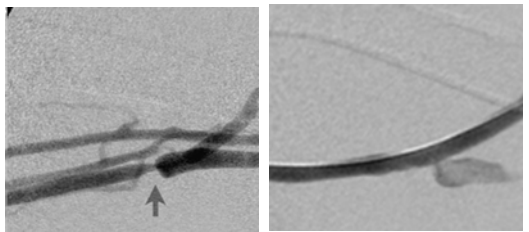


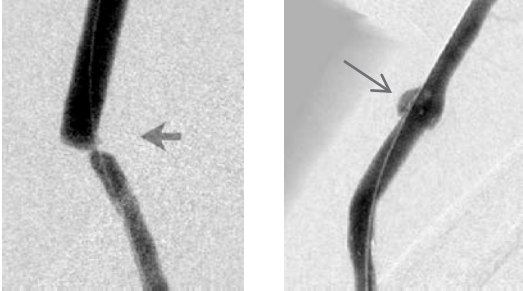
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THANK YOU

What balloon?		High pressure balloons Mean inflation pressures 17.9 for the venous anastomosis Veseley TM, J Vasc Interv Radiol 2006; 17: 623
Size of balloon?	 6mm Graft	Early, new: +1mm = 7mm → 8mm → 9mm →
Angioplasty		Inflate to effacement No routine prolonged inflation No Heparin (if graft open) No antibiotics
Stop		Guidelines: <30% stenosis No stenosis <u>Improved exam, flows back to baseline</u>

What stent?		Covered Flexible Viabahn *Bard Covera trial ongoing
Size of stent?	 Endovascular Today, June 2014	Matched to graft side OK to mismatch with vein
Deployment		Landing zones Distal -into the graft Proximal - avoid valves
Stop		No stenosis <u>Improved exam, flows</u> <u>back to baseline</u>